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THE AMERICAN NATURALIST

VOL. XXVII.

March, 1893.

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THE QUANTITY OF HUMAN LIFE.

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Compared with periods of terrestrial history the duration of a human life even at the very longest is exceedingly brief. In our own time only a very few people ever live to see their hundredth birthday, and the average age is now calculated on the basis of elaborate statistics to fall between thirty-three and thirty-four years.

It seems to be a prevalent opinion among unreflecting people, that the quantity of an individual life is expressed by the number of days and years recorded on his or her tombstone. That such an opinion is erroneous will be rendered evident by a little consideration. First of all, in estimating the quantity of human life, we must possess some well defined conception of what we mean by the term life. This point settled, we can proceed with some degree of certainty in our calculation. Whoever has devoted a little thought to the subject, cannot fail to be deeply impressed with the multitude and diversity of the factors which enter into the experiences of a life-time. There are the ever changing phenomena of the external world awakening and controlling the states of consciousness. There are the equally changeful individual activities perpetually giving rise to new internal changes. In other words, there is the physiological life utilizing the forces of nature, and making them subservient to the wants of the individual economy ;

and, by its side, generating and directing its activities is its ever present companion the psychological life. Here then, we have a duplicate existence, extending over a finite period of years, incessantly changing from the time of its beginning, throughout the periods of growth, maturity and decay, and ultimately resolved, so far as human observation goes, into other existences of a lower order.

Life, then is an existence. It is an existence characterized by incessant changes, and those changes are the manifestations of force. Hence, disregarding all ontological questions, the quantity of life may be measured like any other force, by the product of its intensity into the time of its duration. Let us now consider the factors which enter into and control the intensities of human life. Subjectively considered, life is obviously made up of a series of conscious experiences; objectively considered, it is made of a succession of molecular and molar motions. To avoid too great complications we will consider it only subjectively, since the objective life has much in common with the motions of dead matter.

Hobbes has well said "it is almost all one for a man to be sensible of one and the same thing, and not to be sensible at all of anything." For instance the ticking of a clock continued unintermittently through days, months, and years, forms a rhythm in the conscious life which is equivalent to silence. Not until it ceases are we aroused to a consciousness of its former existence. The same is true of all familiar and oft repeated experiences. No matter how intense and vivid may have been the first appeal of an experience, sooner or later its reiterated occurrence establishes itself in the rounded and frictionless ruts of an indifferent consciousness. It might at first be inferred from this law, that for the conscious life to attain to its maximum intensity, it should experience the rarest stimuli; and those stimuli should be as intense as possible. There is a limit however, beyond which novelties fail to be impressive, and the over stimulated and flagging consciousness relapses into apathy and indifference. But as a general rule we may be guided by Hobbes' statement, and from its converse deduce the proposition, that the intensity of

conscious life varies as the number and rarity of its experiences. But the number and rarity of its experiences depend upon a great variety of circumstances.

They depend upon the diversity of external conditions. They also depend upon the extent and acuteness of surfaces of contact, and the rapidity with which those surfaces are transported into new environments. Finally they will depend upon the stock of vitality of the individual. All these factors must be considered in estimating the quantity of the conscious life. The diversities of external surroundings are very great. Even in primitive communities, and amid the habitual isolations incident to a nomadic life, the differences in the attitudes and groupings of the objects of inanimate nature, and of the lower orders of animate nature, are ever stimulating the conscious life to new and intense experiences. Surprises, alarms, friendship, apathies, pleasures and pain are ever appealing in new and varied relations to the would-be slumbering sensibilities. But when we pass from the primitive condition of solitude to the later condition of society where the wide play of forces concerned in human interests is brought to bear in a multiplicity of combinations upon the individual life, the number of conscious experiences increases with the members of the community not in an arithmetical, but in a geometrical ratio. This holds up to a certain point when the maximum of conscious experiences during a given time is reached.

The limit is a subjective and not an objective one. It is determined by the capacity for reception of the individual. Amid the intricacies of modern civilized life that limit is speedily reached. Even the most capacious and versatile minds soon weary of the endless solicitations of the senses and the trains of ratiocination to which they give rise. The keen activity of such minds is rapidly dulled by the continuous impact of stimuli, and soon falls back upon the restful reiteration of former experiences. But even the repose of such reminiscences is disturbed by the jars and turmoils of inevitable environments, and the drowsy sensibilities are spurred on to renewed activities day after day so long as life continues. Thus it happens that the average life of the social individual

is much more intense than that of the inhabitant of solitudes. The reason is, that the sociological stimuli affect us more than stimuli of equal or even greater intensity proceeding from inanimate nature, or the lower orders of animate nature. Society also engenders wide differences in the experience of its various members on account of financial, political and other differences. The humdrum life of the common laborer is much less varied, and, therefore much less intense than the life of the gentleman of affluence and leisure who diversifies his experiences by travel, letters, society and recreative sports.

The lavish distribution of cheap literature within the last quarter of a century has immensely augmented the differences in the quantities of living among people of the same social standing. It is not uncommon to find two men engaged in the same occupation one of whom cannot read or write, while the other is conversant with the widest questions of political and social progress. Literature thus tends to obliterate the quantitative differences of life arising from certain social accidents of birth, and places all men, so far as the intellectual consciousness is concerned, on pretty much the same level as quantitative experiences. Much more might be said as to the diversities of the external conditions, but this must suffice.

We now pass on to consider the surfaces of contact. Under this designation are included all the external integuments of the body as the skin, eyes, hair, and so on. For the sake of mathematical simplicity we will assume at present that equal surfaces of contact possess equal degrees of sensibility in two individuals during equal periods of time. Then if one person present twice as much surface of contact as another, that person will, other things equal, receive twice as many peripheral stimulations as the other. (We here assume that an equal number of stimulations come from every direction against the unit of the surface.) Now the surfaces of contact vary as the square of some lineal unit. Suppose the surfaces of contact be 4 and 8 respectively; then the linear units are 2 and $2.8+$. But the masses and weights of the bodies whose surfaces are 4 and 8 vary as the cube of the linear units, or as

$2^3 = 8$ and $(2 \cdot 8 +)^3 = 22 \cdot 4 +$. Now in order that the individual with double the surface of contact may encounter twice as many stimuli as the other, when both are moving through their environment, it must move the same distance as the other. In moving such a distance however, it will perform not twice but nearly three times the amount of work that the other performs since it will transport nearly three times the weight. Thus, if the expenditure of muscular energy detracts from the stock of vitality, and hence dulls the keenness of the sensibilities, even though the surfaces of contact of the two individuals possess initially the same degree of sensibility by reason of that impairment, the larger animal would experience less than twice as much consciousness as the smaller. Viewed from another standpoint, the smaller animal could execute more than twice the velocity of the larger with equal expenditure of strength, (disregarding the resistance of the medium), and hence it would encounter more than an equivalent number of experiences.

It was here assumed that equal surfaces of contact conveyed equal quantities of sensibility in the two individuals, but it is well known to physiological psychologists that there are immense differences in the relative acuteness of the different sense organs in the same individual, and in the same sense organs in different individuals. The optical, auditory and tactile powers are quite variable. Probably the experiential products of all the other senses combined do not equal those which come through the medium of vision. It will thus be readily inferred that the extent of surfaces of contact is less important in relation to the experiences of the conscious life than their quality; and the movements of the individual tending to multiply experiences are less important than the movements of the environment. For example, an observer standing on a street corner in a great city, or riding in a railway coach at forty miles an hour, will gather more experiences than he would were he to run at the top of his speed in a deserted field. Doubtless he might experience a high degree of exhilaration at first, yet experience of effort would prevail. Such experiences like all other somatic feelings have a place

in consciousness, but they certainly do not have that vivid and definite character which distinguish peripheral sensations. Moreover they must detract from the general vitality, and lower the tone of the higher orders of experience.

There can be no doubt that the stock of vitality, and the natural endowments of body and mind immensely transcend all the other differences hitherto considered. Not only do they give rise to differences in the intensity, but also in the duration of life. The vigorous, alert, and impressionable nature has a livelier consciousness of all that it experiences, responds more keenly to all its enjoyments, and resists more stubbornly the wracking and dissolution of conflict and disease. Hence such an individual lives longer and lives more. There are still other differences of a psychological character which give rise to still more important variations in the quantity of the conscious life. Owing to the absence of any standards in the higher fields of psychometric research, it is hard to discriminate between quantitative and qualitative differences. Yet viewed from a rational standpoint it cannot be doubted that different kinds of consciousness are quantitatively different, though there is no perceptible disparity in their relative intensities. That the untutored savage feels as intense gratification in the pursuit of his game, as the astronomer in the pursuit of undiscovered asteroids, cannot reasonably be doubted. But how totally different the quality of the feeling, and the psychological grounds upon which it is based! Where the thoughts and emotions are different in kind, this disparity is even greater. There are certain thoughts and emotions accessible to the few which are totally beyond and above the range of the average mind. Such thoughts as those of Laplace and Kant, and such emotions as those of Schiller, are of this order.

While it may not be easy to defend the position, yet we feel forced to believe that there are quantitative differences between such thoughts and emotions, and the stolid apathy, and gross materialistic conceptions of the mediocre mind.

Up to this point we have considered the conditions which modify the quantity of the conscious life in a general way. But the quantity of the life of every human being is subject to

innumerable vicissitudes both accidental and periodic. While there is an endless influx of disturbing forces which augment or deplete the quantity of life at all times, yet there are certain periodic causes which promote recurrence of cycles of consciousness. Such are the alterations of day and night, the recurrence of the seasons, and the widely extended observance of days and customs. How much the quantity of life is temporarily augmented by the convivialities of Christmas and other commemoration days! Then there is a diurnal rise and fall in the conscious life. The morning with its vivid and buoyant sensations; the rising of the energies and their temporary lull at midday, and their slow descent with the descending of the sun. Then the twilight comes on with its calm reflections and feelings, succeeded by the serenity of sleep. But even here the pulse of consciousness rises and falls, summoned into being by the vague apparitions and muffled sounds of dreams. At length these increase in vividness and frequency, the pulse of consciousness grows more intense until we are again ushered into the hazy realities of another morning. Then there are the periodicities arising from the changing seasons.

To one who dwells during a period of years in the same place, the events which are repeated from year to year are much in excess of those which are variable. Hence the annual rhythms of consciousness are quite well marked. The conscious life throughout the time of its existence is subject to quite well defined periods of change. There are several striking analogies between the consciousness of infancy and that of extreme old age. Both are oblivious of details, apprehending only to the salient outlines and strong qualities of things. Both repeat and re-repeat simple things, the babe its lullaby, the old man his favorite story. The consciousness of old age is reminiscent because the powers are feeble, and reminiscences are paths of least resistance. Quite otherwise is the consciousness of youth and the prime of life. It is vigilant and aggressive, and ever seeking new combinations of experience. Not only is the quantity of the conscious life extremely varied in its different periods of development, but also in its quality. In

early years and even far into the period of maturity the physiological activities prevail. Childhood and early youth are characterized by the aimless movements of spontaneity and the prodigal expenditure of physical force ; later on the psychological life rises in importance and attains its maximum when the physiological life is on the wane. This continues until the decay of old age sets in.

A grander series of changes remains yet to be considered. This is suggested by the query, how does the quantity of human life existing on the globe at the present time compare with the quantity of the antecedent times? Whoever reviews the history of the race during the nineteenth century as related to its history in previous times will observe a tremendous acceleration in the rate of living, and a vast augmentation in the intensity of human life. Notable among the causes which have secondarily conspired to this end, may be mentioned the centralization of populations. Within a century, according to the *London Journal of Statistics* the relative populations of the country and city of England have changed sides. Up to about 1840 the rural population exceeded the urban. About that year they were equal, and ever since, the cities have had a constantly increasing majority. The same is true in general of other civilized countries. Facts like these tend to show that the society of modern life is becoming more consolidated, and hence the aggregate of human experiences is becoming increasingly intense from year to year. Among the primary causes which have brought about this consolidation, are the improved facilities of travel, commerce, and communication between mind and mind. Not only have they done this, but they are the indispensable conditions of an intricate co-operative existence. But these are only a few of the many factors which enter the problem of this augmentation of life. The differentiation of pursuits and the widely diversified products of human genius, all minister to the ever broadening possibilities of human experience. To-day the child under its teens is much more sophisticated than was its semi-savage ancestors of four-score years who lived only a few generations ago. Even the lower animals in the bustling communities

lead a more varied life than primitive men, probably more varied than our contemporary the Fuegian, whose life is a monotonous ordeal of physical suffering, or the Esquimau whose days are passed in the unbroken solitudes of Arctic America. In view of these unprecedented changes, and the steady increase of population, it is but a step to the conclusion that the quantity of human life on the globe to-day is greater than ever before. In all probability the aggregate quantity of conscious life which has been experienced during the nineteenth century is [far greater than the life experienced in any antecedent period of equal duration. Never was there a recorded time when the drain upon natural resources was so great as it is to-day. These resources are all turned either directly or indirectly toward the furtherance of human experience. Not only do these agencies of civilization add to the multiplicity of human experiences, but they also add to their pleasurable-ness. Thus undaunted by the clamors of pessimism we may firmly believe that the sum of human happiness is greater to-day than ever before.

The marked feature with which we are impressed in reviewing the evolution of human life, is its growing complexity. But by the very terms of a previous proposition, this signifies a growth in the quantity of conscious experience. All primitive life was simple and plain. Monotony was stamped upon its music, language, gesture, and the rounds of domestic, social and political life. The frequent repetitions of barbarian speech, and the sing-song tones of their music are in pitiable contrast to the sweeping climax and anti-climax of the civilized orator or opera singer.

The principle is of general application. All orders of experience are more varied in the civilized than in the savage state. Hence the quantity of life for each individual is greater, and the totality of human experiences immensely greater with the diffusion of civilization. We have now considered some of the factors which determine the quantity of human life. The final inquiry remains, how are we to live most? and how is the race to live most? Judging from the foregoing conclusions we would say in the case of the individual, that this end is

insured by multiplying the number, intensity, and variety of his experiences. Spinoza had for a motto, "to live is to think." Surely the quantity and quality of our thinking has much to do with the quantity and quality of our living, but from considerations already discussed, this utterance seems to be wanting in comprehensiveness. If this statement were true without qualifications, then he who thinks most lives most, but we have already seen that other experiences than those of thought have perhaps an equal degree of intensity, and involve an equal amount of living. Any conclusion which can be reached on this question is necessarily colored by personal prejudices, and cannot be set up as a general standard. To me, at least, he seems to live most who enjoys the greatest possible range of conscious experiences of the highest order, during the longest period of time. And the quantity of life seems to be truly greatest which embodies the fullest and highest expression of the attributes of the intellect, the emotions and the will.

Not where the experiences are confined to one of these alone, but where all three have equal sovereignty in the dominion of the mind. He seems to me to live less whose life embodies one or all of these in a less degree, or who has sullied their original purity with baser purposes and ends. Perhaps this may seem too ethical for a scientific statement but until that same ethical spirit shall more fully actuate the promoters of science, its highest beauty and usefulness cannot be completely realized. Even the best of us lead much more diminutive lives than our circumstances require. If we would but remember that it is as easy to think great thoughts as to think little thoughts, and feel great emotions instead of base and belittling ones, we might all enter into a largeness of life which far exceeds its present dimensions. But we must pass on to consider the question how can the race live most? One thing is certain, while all are permitted to think and feel and will, all cannot be brain workers. There must be doers as well. Society is so organized that no small part of its members must perform physical labor. This being the case, to realize the maximum of conscious life, there must be the greatest possible number of mental laborers, and the least pos-

sible number of physical laborers ; and in each case the maximum of consciousness must be sought. Speculative as these views may appear yet they are substantiated by historical fact. To-day when the quantity of human life is greatest, the physical laborers effect most with the least effort, and the mental laborers are constantly diminishing that effort. So that were a given status of living to continue, the physical laborers would decrease, and the mental laborers would increase until finally equilibrium should be attained.

Such equilibrium however, is indefinitely postponed by the constantly ascending standard of living. But as the standard of living ascends, all live more, and, since the physical laborers diminish and the mental laborers increase, the quantity of life is still further augmented. This would happen were the population to remain constant. But as the standard of life rises, the possibilities of existence increase, and the death rate diminishes. Consequently the population increases as the quantity of the individual life increases, and hence the total quantity of human life is augmented by both of these reciprocating factors. How great the quantity of human life may some day be is a question which the developments of the future alone can decide.

If the present rate of its growth shall continue unabated, sooner or later the time will come when it can increase no more. All the resources of the earth will be utilized and strained to the utmost to augment that life. But they cannot. Gradually the potential energies of nature which support life will be dissipated as energy of motion. And as those energies dwindle and disappear, the quantity of human life will fall away contemporaneously. The time must come when that quantity will be zero.